

REMARKS

Claims 1-3, 5-7, 9, 10 and 12 are pending in this application. By this Amendment, claims 1 and 5 are amended.

I. Personal Interview

The courtesies extended to Applicants' representative by Examiner Chang during the interview held May 3, 2005, are appreciated. The reasons presented at the interview as warranting favorable action are incorporated into the remarks below and constitute Applicants' record of the interview.

II. Claim Rejections Under 35 U.S.C. §112

Claims 1-3, 5-7, 9, 10 and 12 are rejected under 35 U.S.C. §112, first paragraph. The rejection is respectfully traversed.

As the claims are amended in light of the personal interview, the rejection is moot. Accordingly, withdrawal of the rejection of claims 1-3, 5-7, 9, 10 and 12 is respectfully requested.

III. Claim Rejection Under 35 U.S.C. §102

Claims 1, 3 and 6 are rejected under 35 U.S.C. §102(e) as anticipated by U.S. Patent 6,347,619 to Whiting et al. The rejection is respectfully traversed.

Whiting fails to disclose each and every feature recited in the rejected claims. For example, Whiting fails to disclose a device for controlling an internal combustion engine with a variable valve system wherein, while a piston of the engine descends during an expansion stroke in a cylinder of the engine, an intake valve is opened by the variable valve system for the intake valve such that intake air is supplied into the cylinder from the engine intake system, and pressure in the cylinder is lowered by opening an exhaust valve by the variable valve system for the exhaust valve before said intake valve is opened.

As discussed during the interview, Whiting relates to an exhaust gas recirculation (EGR) system for a turbo-charged, internal combustion engine. Whiting describes an internal combustion engine having intake valve 18, a primary exhaust valve 16, and a secondary exhaust valve 20. The valves are controlled to achieve exhaust gas recirculation that results in delivery of exhaust gas from the exhaust system to the engine's intake manifold for mixing with intake air and delivery to the engine's combustion chambers 14 (col. 3, lines 50-54).

In Whiting, exhaust gas flows from each combustion chamber through a primary exhaust port 22 in the cylinder head to an exhaust manifold 24. From there the exhaust gas flows through an exhaust inlet 26 to a turbine 28 of a turbo charger 30 (col. 2, lines 61-65). In other words, exhaust flowing from the primary exhaust valve 16 follows a normal or traditional route in a turbo-charged engine. Whiting goes on to describe a secondary exhaust valve 20 from which exhaust flows into an EGR manifold 44 and can pass through one of a plurality of EGR valves before mixing with the intake air in the intake manifold (col. 3, lines 3-11).

Whiting offers no description in the specification of the position or control of either of the intake valves 18. Furthermore, Fig. 3 is a graph of the combustion chamber pressure versus crank angle that illustrates the valve opening and closing during exhaust gas recirculation. The figure fails to disclose that an intake valve is opened while the piston of the engine descends during an expansion stroke, and that an exhaust valve is opened before the intake valve is opened. Rather, as shown in Fig. 3, only the secondary exhaust valves and primary exhaust valves are opened during the expansion phase of the piston cycle, which is occurring between zero and 180 degrees of crank angle. Fig. 3 clearly shows that the intake valve is not opened until the exhaust phase just prior to the 360 degree crank angle. Thus, Whiting fails to disclose each and every feature recited in the rejected claims. Accordingly,

withdrawal of the rejection of claims 1, 3 and 6 under 35 U.S.C. §102(e) is respectfully requested.

IV. Claim Rejections Under 35 U.S.C. §103

Claims 1, 3, 6 and 10 are rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent 4,628,880 to Aoyama et al. in view of Whiting. The rejection is respectfully traversed.

Neither Aoyama or Whiting, whether considered alone or in combination, disclose or suggest each and every feature recited in the rejected claims. For example, the combination of references fails to disclose or suggest a device for controlling an internal combustion engine with a variable valve system wherein, while a piston of the engine descends during an expansion stroke in a cylinder of the engine, an intake valve is opened by the variable valve system for the intake valve such that intake air is supplied into the cylinder from the engine intake system, and pressure in the cylinder is lowered by opening an exhaust valve by the variable valve system for the exhaust valve before said intake valve is opened.

As discussed during the interview, Aoyama relates to an intake system for an internal combustion engine that has multiple inlet valves for each combustion chamber to reduce the amount of residual gas retained in the combustion chamber and the intake system immediately upstream of the combustion chamber, when the engine is operating under low speed/load conditions such as idling (col. 1, lines 8-17).

Aoyama describes an internal combustion engine having intake valves 14, 16 and exhaust valves 18, 20 at each cylinder. The Office Action alleges that Fig. 6 discloses the features recited in the rejected claims. However, as clearly shown in Fig. 6, during the expansion phase of the combustion cycle (i.e., "just after combustion") which occurs between top dead center (TDC) and bottom dead center (BDC), neither of the intake valves 14 or 16 are open. Accordingly, Aoyama does not disclose each and every feature as alleged in the

Office Action. Accordingly, withdrawal of the rejection of claims 1, 3, 6 and 10 under 35 U.S.C. §103(a) is respectfully requested.

Claims 2, 7 and 9 are rejected under 35 U.S.C. §103(a) as unpatentable over Aoyama in view of Whiting, and further in view of U.S. Patent 3,953,969 (Mori); and claims 5 and 12 are rejected under 35 U.S.C. §103(a) as unpatentable over Aoyama in view of Whiting, and further in view of U.S. Patent 5,611,303 (Izuo). The rejections are respectfully traversed.

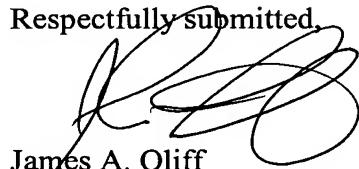
All of claims 2, 5, 7, 9 and 12 are allowable for at least their dependency on their independent base claims for the reason discussed above, or for the additional features recited therein. Furthermore, as neither of the additional references to Mori or Izuo overcome the deficiencies of Whiting and Aoyama, withdrawal of the rejection of claims 2, 5, 7, 9 and 12 under 35 U.S.C. §103(a) is respectfully requested.

V. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-3, 5-7, 9, 10 and 12 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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